Grade 12: Practical 1.2 Genetics – 7 May 2025 – Scope

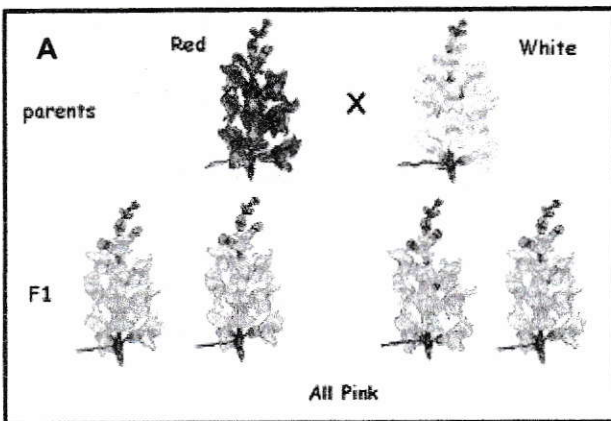| TOPICS	Mark allocation
Genetics	30
Scientific investigation	**General skills:** • Make sure you can draw all type of graphs, pie, bar, histogram and line graph • Determine **independent and dependent variables** • How to improve **reliability and validity** • **Planning steps** • Draw conclusion • **Calculation in decrease and increase in percentage – Revise this with learners** *#Please share the video on scientific investigations with your learners*
Terminology	Gene and Allele, Dominant and recessive alleles, Phenotype and Genotype, Homozygous and Heterozygous
Type of Dominance	**Complete dominance** – one allele is dominant and the other is recessive, such that the effect of the recessive allele is masked by the dominant allele in the heterozygous condition **Incomplete dominance** – neither one of the two alleles of a gene is dominant over the other, resulting in an intermediate phenotype in the heterozygous condition **Co-dominance** – both alleles of a gene are equally dominant whereby both alleles express themselves in the phenotype in the heterozygous condition
Monohybrid crossings	Format for representing a genetic cross
Dihybrid crosses	**Mendel's Principle of Independent Assortment** – The various 'factors' controlling the different characteristics are separate entities, not influencing each other in any way, and sorting themselves out independently during gamete formation Be able to answer questions on Dihybrid crossings
Blood grouping	Different blood groups are a result of multiple alleles The alleles I^A, I^B and i in different combinations result in four blood groups Determine genotype and phenotypes of parents and off springs

Cicilia can Heerden
(Acting PSC: Life Sciences)

Date: 25/05/2025

LIFE SCIENCES GRADE 12

PRACTICAL TASK 1.2: Genetics and inheritance

DATE: 09 MAY 2019

NAME: _____

TIME: 30 MIN

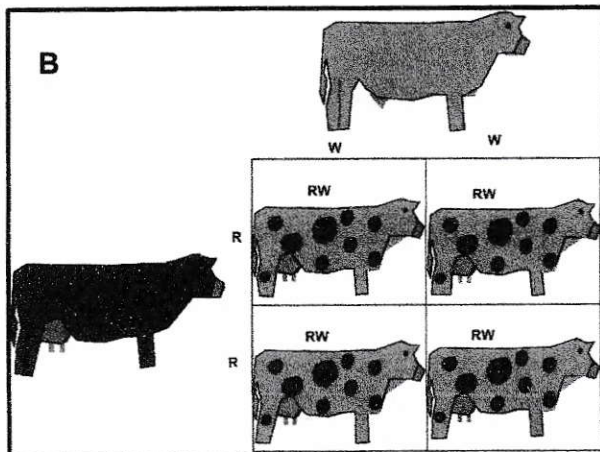| Total	
	30

QUESTION 1

The diagrams below illustrates the three types of dominance in genetics.

1.1   Identify the three types of dominance and explain what each entails.

A _____

_____

_____

_____

_____

_____

_____

B _____

_____

_____

_____

_____

_____

_____

C _____

_____

_____

_____

_____

_____

_____

(3 x 2)   (6)

LIFE SCIENCES GRADE 12

PRACTICAL TASK 1.2

education
Department of
Education
FREE STATE PROVINCE

GENETIC LINEAGES/PEDIGREES & MUTATONS

DATE: 1 June 2021

TIME: 30 minutes

MARKS | 30 |
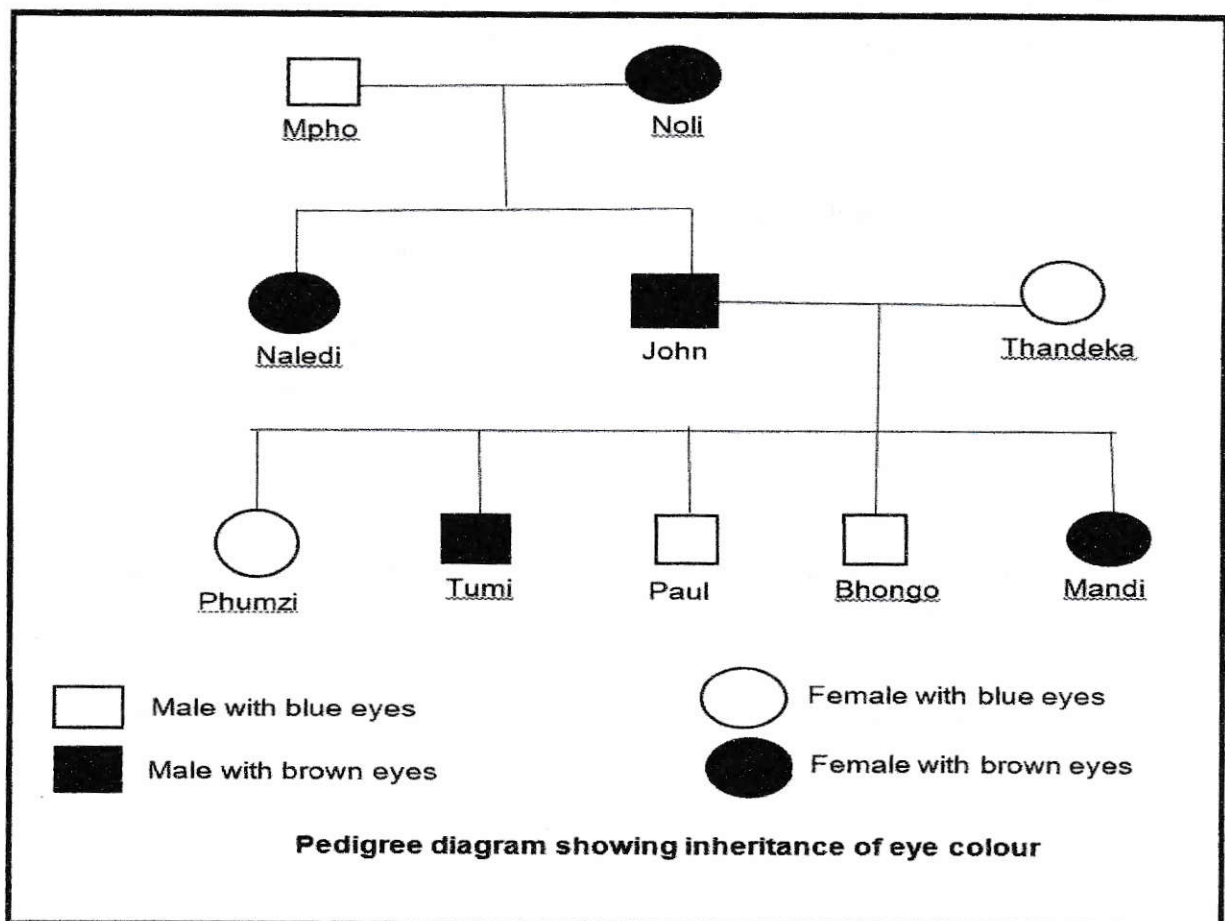
NAME: ....

QUESTION 1

The pedigree diagram below shows the inheritance of eye colour over several generations in a family. Brown eye colour **(B)** is dominant over blue eye colour **(b).**

Pedigree diagram showing inheritance of eye colour

1.1   How many members of the family have blue eyes?

_____   (1)

QUESTION 2

2.1 An investigation was conducted to determine the possibility of eye and hair color
in the Farrell family. The parents are heterozygous for both traits.

Use the following key for the alleles:

B = brown hair   **b** = blond hair   **G** = brown eyes   **g** = green eyes

2.1.1 Write down the genotype of the parents.

_____   _____

(2)

2.1.2 If a male gamete, containing the alleles b and G, fuses with a female gamete
with the same alleles, give the following for the child:

(a) Genotype   _____

(b) Phenotype for hair   _____

(c) Phenotype for eyes   _____   (3)

2.1.3 Give the phenotypic ratio of the possible F₁ offspring of these parents.
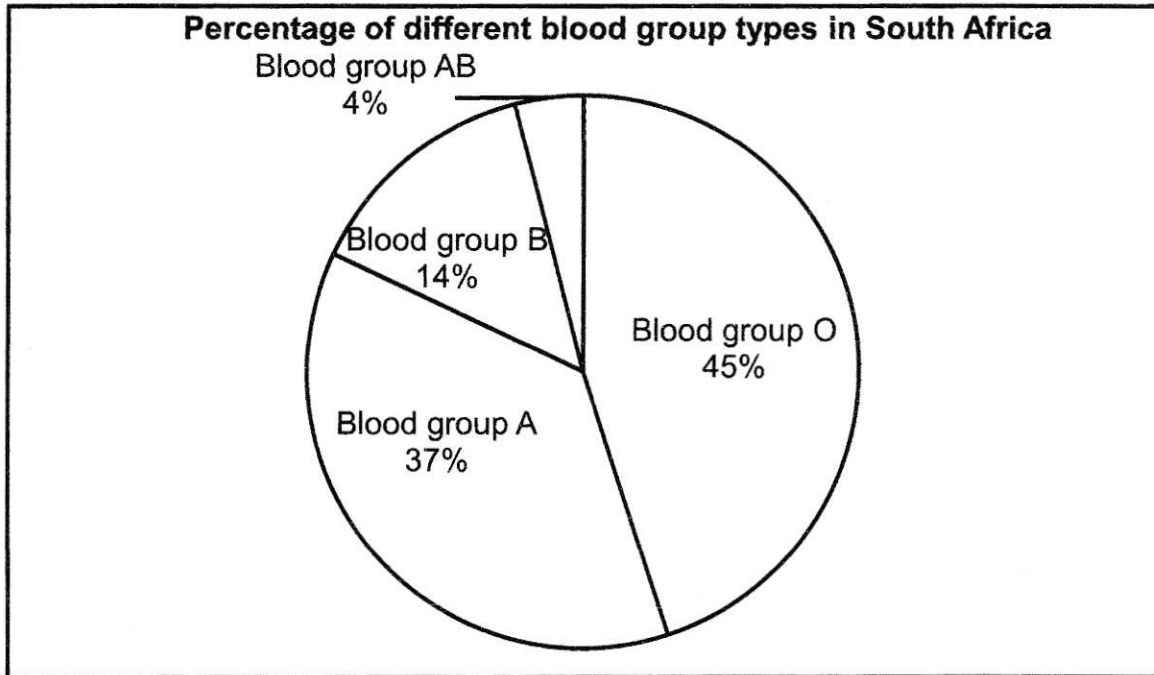
_____

(2)

2.1.4 How many of the possible 16 offspring in the above crossing will have the same
genotype as the parents?

_____

(1)

(8)

QUESTION 3

3.1 The graph below represents the percentage of blood types found in South Africa.

Percentage of different blood group types in South Africa

Blood group AB 4%

Blood group B 14%

Blood group O 45%

Blood group A 37%

3.1.1 Give the genotype of blood group O _____ (1)

3.1.2 On May 1st 2019 it was recorded that South Africa has a population of 55 437 815 people. Use the information in the graph to calculate the number of people with blood group A. Show all working.

_____

_____

_____

(3)